PENDING CLAIMS AS AMENDED

Please amend the claims as follows:

1. (Original) An infrastructure element, comprising:

a modulator configured to time-division-multiplex a plurality of orthogonally covered digital data sequences and a sequence of pilot symbols to generate a sequence of digital values for transmission on a communications channel; and

a transmitter coupled to the modulator and configured to receive the sequence of digital values from the modulator, convert the sequence of digital values to an analog waveform, and transmit the analog waveform on the communications channel.

2. (Original) The infrastructure element of claim 1, wherein the modulator comprises an orthogonal cover element configured to exclusive-OR each bit of a sequence of digital data bits with a plurality of orthogonal sequences to generate the plurality of orthogonally covered digital data sequences.

3. (Original) The infrastructure element of claim 1, wherein the modulator further comprises a multiplexer configured to time-division-multiplex the plurality of orthogonally covered digital data sequences and the sequence of pilot symbols by segmenting the plurality of orthogonally covered digital data sequences into first and second subsets, inserting the sequence of pilot symbols immediately subsequent in time to the first subset, and inserting the second subset immediately subsequent in time to the sequence of pilot symbols to generate the sequence of digital values for transmission.

4. (Original) The infrastructure element of claim 1, wherein the modulator further comprises a multiplexer configured to time-division-multiplex the plurality of orthogonally covered digital data sequences and the sequence of pilot symbols by puncturing the sequence of pilot symbols into the plurality of orthogonally covered digital data sequences such that a first subset of the plurality of orthogonally covered digital data sequences precedes in time the sequence of pilot

symbols and the sequence of pilot symbols precedes in time a second subset of the plurality of orthogonally covered digital data sequences.

5. (Original) The infrastructure element of claim 2, wherein the modulator further comprises a multiplexer configured to time-division-multiplex the plurality of orthogonally covered digital data sequences and the sequence of pilot symbols by segmenting the plurality of orthogonally covered digital data sequences into first and second subsets, inserting the sequence of pilot symbols immediately subsequent in time to the first subset, and inserting the second subset immediately subsequent in time to the sequence of pilot symbols to generate the sequence of digital values for transmission.

6. (Original) The infrastructure element of claim 2, wherein the modulator further comprises a multiplexer configured to time-division-multiplex the plurality of orthogonally covered digital data sequences and the sequence of pilot symbols by puncturing the sequence of pilot symbols into the plurality of orthogonally covered digital data sequences such that a first subset of the plurality of orthogonally covered digital data sequences precedes in time the sequence of pilot symbols and the sequence of pilot symbols precedes in time a second subset of the plurality of orthogonally covered digital data sequences.

7. (Original) An infrastructure element, comprising:

means for modulating configured to time-division-multiplex a plurality of orthogonally covered digital data sequences and a sequence of pilot symbols to generate a sequence of digital values for transmission on a communications channel; and

means for transmitting coupled to the means for modulating and configured to receive the sequence of digital values from the means for modulating, convert the sequence of digital values to an analog waveform, and transmit the analog waveform on the communications channel.

8. (Original) The infrastructure element of claim 7, further comprising an orthogonal cover element configured to exclusive-OR each bit of a sequence of digital data bits with a plurality of orthogonal sequences to generate the plurality of orthogonally covered digital data sequences.

9. (Original) The infrastructure element of claim 7, wherein the means for modulating is further configured to time-division-multiplex the plurality of orthogonally covered digital data sequences and the sequence of pilot symbols by segmenting the plurality of orthogonally covered digital data sequences into first and second subsets, inserting the sequence of pilot symbols immediately subsequent in time to the first subset, and inserting the second subset immediately subsequent in time to the sequence of pilot symbols to generate the sequence of digital values for transmission.

10. (Original) The infrastructure element of claim 7, wherein the means for modulating is further configured to time-division-multiplex the plurality of orthogonally covered digital data sequences and the sequence of pilot symbols by puncturing the sequence of pilot symbols into the plurality of orthogonally covered digital data sequences such that a first subset of the plurality of orthogonally covered digital data sequences precedes in time the sequence of pilot symbols and the sequence of pilot symbols precedes in time a second subset of the plurality of orthogonally covered digital data sequences.

11. (Original) The infrastructure element of claim 8, wherein the means for modulating is further configured to time-division-multiplex the plurality of orthogonally covered digital data sequences and the sequence of pilot symbols by segmenting the plurality of orthogonally covered digital data sequences into first and second subsets, inserting the sequence of pilot symbols immediately subsequent in time to the first subset, and inserting the second subset immediately subsequent in time to the sequence of pilot symbols to generate the sequence of digital values for transmission.

12. (Original) The infrastructure element of claim 8, wherein the means for modulating is further configured to time-division-multiplex the plurality of orthogonally covered digital data sequences and the sequence of pilot symbols by puncturing the sequence of pilot symbols into the plurality of orthogonally covered digital data sequences such that a first subset of the plurality of orthogonally covered digital data sequences precedes in time the sequence of pilot symbols and

the sequence of pilot symbols precedes in time a second subset of the plurality of orthogonally covered digital data sequences.

13. (Original) A method of transmitting data, comprising:

time-division-multiplexing a plurality of orthogonally covered digital data sequences and a sequence of pilot symbols to generate a sequence of digital values;

converting the sequence of digital values to an analog waveform; and

transmitting the analog waveform on a communications channel.

14. (Original) The method of claim 13, further comprising exclusive-ORing each bit of a sequence of digital data bits with a plurality of orthogonal sequences to generate the plurality of orthogonally covered digital data sequences.

15. (Original) The method of claim 13, wherein the time-division-multiplexing comprises segmenting the plurality of orthogonally covered digital data sequences into first and second subsets, inserting the sequence of pilot symbols immediately subsequent in time to the first subset, and inserting the second subset immediately subsequent in time to the sequence of pilot symbols to generate the sequence of digital values for transmission.

16. (Original) The method of claim 13, wherein the time-division-multiplexing comprises puncturing the sequence of pilot symbols into the plurality of orthogonally covered digital data sequences such that a first subset of the plurality of orthogonally covered digital data sequences precedes in time the sequence of pilot symbols and the sequence of pilot symbols precedes in time a second subset of the plurality of orthogonally covered digital data sequences.

17. (Original) The method of claim 14, wherein the time-division-multiplexing comprises segmenting the plurality of orthogonally covered digital data sequences into first and second subsets, inserting the sequence of pilot symbols immediately subsequent in time to the first subset, and inserting the second subset immediately subsequent in time to the sequence of pilot symbols to generate the sequence of digital values for transmission.

18. (Original) The method of claim 14, wherein the time-division-multiplexing comprises puncturing the sequence of pilot symbols into the plurality of orthogonally covered digital data sequences such that a first subset of the plurality of orthogonally covered digital data sequences precedes in time the sequence of pilot symbols and the sequence of pilot symbols precedes in time a second subset of the plurality of orthogonally covered digital data sequences.

19. (Original) A communications unit, comprising:

a receiver configured to receive a time-division-multiplexed signal including a plurality of orthogonally covered data sequences and a sequence of pilot values; and

a demodulator coupled to the receiver and configured to receive the time-division-multiplexed signal from the receiver and demodulate the plurality of orthogonally covered data sequences.

20. (Original) The communications unit of claim 19, wherein the demodulator is further configured to use the sequence of pilot values to coherently demodulate the plurality of orthogonally covered data sequences.

21. (Original) The communications unit of claim 19, wherein the plurality of orthogonally covered data sequences each includes a set of data values that has each been spread by an orthogonal sequence, there being a distinct orthogonal sequence assigned to each set of data values.

22. (Original) The communications unit of claim 19, wherein a first subset of the plurality of orthogonally covered data sequences occupies a first time segment of the time-division-multiplexed signal, the sequence of pilot values occupies a second time segment of the time-division-multiplexed signal, and a second subset of the plurality of orthogonally covered data sequences occupies a third time segment of the time-division-multiplexed signal.

23. (Original) The communications unit of claim 22, wherein the first and third time segments are noncontiguous.

24. (Original) The communications unit of claim 22, wherein the first time segment precedes the second time segment and the second time segment precedes the third time segment.

25. (Original) The communications unit of claim 24, wherein the demodulator comprises a demultiplexer configured to demultiplex the time-division-multiplexed signal to generate the plurality of orthogonally covered data sequences and the sequence of pilot values.

26. (Original) The communications unit of claim 25, wherein the demodulator is further configured to use the sequence of pilot values to coherently demodulate the plurality of orthogonally covered data sequences.

27. (Original) The communications unit of claim 26, wherein the plurality of orthogonally covered data sequences each includes a set of data values that has each been spread by an orthogonal sequence, there being a distinct orthogonal sequence assigned to each set of data values.

28. (Original) A communications unit, comprising:

means for receiving configured to receive a time-division-multiplexed signal including a plurality of orthogonally covered data sequences and a sequence of pilot values; and

means for demodulating coupled to the means for receiving and configured to receive the time-division-multiplexed signal from the means for receiving and demodulate the plurality of orthogonally covered data sequences.

29. (Original) The communications unit of claim 28, wherein the means for demodulating is further configured to use the sequence of pilot values to coherently demodulate the plurality of orthogonally covered data sequences.

30. (Original) The communications unit of claim 28, wherein the plurality of orthogonally covered data sequences each includes a set of data values that has each been spread by an orthogonal sequence, there being a distinct orthogonal sequence assigned to each set of data values.

31. (Original) The communications unit of claim 28, wherein a first subset of the plurality of orthogonally covered data sequences occupies a first time segment of the time-division-multiplexed signal, the sequence of pilot values occupies a second time segment of the time-division-multiplexed signal, and a second subset of the plurality of orthogonally covered data sequences occupies a third time segment of the time-division-multiplexed signal.

32. (Original) The communications unit of claim 31, wherein the first and third time segments are noncontiguous.

33. (Original) The communications unit of claim 31, wherein the first time segment precedes the second time segment and the second time segment precedes the third time segment.

34. (Original) The communications unit of claim 33, wherein the means for demodulating comprises means for demultiplexing configured to demultiplex the time-division-multiplexed signal to generate the plurality of orthogonally covered data sequences and the sequence of pilot values.

35. (Original) The communications unit of claim 34, wherein the means for demodulating is further configured to use the sequence of pilot values to coherently demodulate the plurality of orthogonally covered data sequences.

36. (Original) The communications unit of claim 35, wherein the plurality of orthogonally covered data sequences each includes a set of data values that has each been spread by an orthogonal sequence, there being a distinct orthogonal sequence assigned to each set of data values.

37. (Original) A method of receiving and processing data, comprising:

receiving a time-division-multiplexed signal including a plurality of orthogonally covered data sequences and a sequence of pilot values; and

demodulating the plurality of orthogonally covered data sequences.

38. (Original) The method of claim 37, wherein the demodulating comprises using the sequence of pilot values to coherently demodulate the plurality of orthogonally covered data sequences.

39. (Original) The method of claim 37, wherein the receiving comprises receiving a plurality of orthogonally covered data sequences each including a set of data values that has each been spread by an orthogonal sequence, there being a distinct orthogonal sequence assigned to each set of data values.

40. (Original) The method of claim 37, wherein the receiving comprises receiving a time-division-multiplexed signal wherein a first subset of the plurality of orthogonally covered data sequences occupies a first time segment of the time-division-multiplexed signal, the sequence of pilot values occupies a second time segment of the time-division-multiplexed signal, and a second subset of the plurality of orthogonally covered data sequences occupies a third time segment of the time-division-multiplexed signal.

41. (Original) The method of claim 40, wherein the receiving further comprises receiving a time-division-multiplexed signal wherein the first and third time segments are noncontiguous.

42. (Original) The method of claim 40, wherein the receiving further comprises receiving a time-division-multiplexed signal wherein the first time segment precedes the second time segment and the second time segment precedes the third time segment.

43. (Original) The method of claim 42, further comprising demultiplexing the time-division-multiplexed signal to generate the plurality of orthogonally covered data sequences and the sequence of pilot values.

44. (Original) The method of claim 43, wherein the demodulating using the sequence of pilot values to coherently demodulate the plurality of orthogonally covered data sequences.

45. (Original) The method of claim 44, wherein the receiving further comprises receiving a plurality of orthogonally covered data sequences each including a set of data values that has each been spread by an orthogonal sequence, there being a distinct orthogonal sequence assigned to each set of data values.